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10/677,302	10/03/2003	Yasutaka Nishida	11995/3	9632

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EXAMINER	
MAGEE, CHRISTOPHER R	
ART UNIT	**PAPER NUMBER**
2653	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

Office Action Summary	**Application No.** 10/677,302	**Applicant(s)** NISHIDA ET AL.	
	Examiner Christopher R. Magee	**Art Unit** 2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

1. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (hereinafter Tanaka) (US 5,854,727) in view of Katsumata et al. (hereinafter Katsumata) (US 5,181,149) and further in view of Nakamigawa et al. (hereinafter Nakamigawa) (JP 10-003643).

- Regarding claims 1-3, Tanaka shows a perpendicular magnetic recording system (see Figure 5) comprising a perpendicular magnetic recording medium 2 having a soft magnetic layer 2b and a magnetic recording head 30 for performing magnetic recording on said perpendicular magnetic recording medium, said magnetic recording head having a main pole 511 for finally recording a magnetization reversal on said perpendicular magnetic recording medium 2.

Tanaka does not show a magnetic read head comprises an upper shield, a lower shield and a read element provided between said upper shield and a lower shield.

With that in mind, Katsumata teaches a magnetic recording/reproducing head assembly with a main pole 4, wherein the magnetic read head comprises an upper shield 2 (i.e., auxiliary pole 2), a lower shield 10 and a read element 3 (i.e., magnetic detecting element 3) provided between said upper shield and a lower shield (Figure 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetic head of Tanaka with a magnetic read head which comprises an upper shield, a lower shield and a read element.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the magnetic head of Tanaka with a magnetic read head which comprises an upper shield, a lower shield and a read element in order to eliminate noises, such as ghost etc., during reproduction, which would be caused by a false gap of an induction head assembly (*Katsumata*; col. 11, lines 1-5).

Further, Tanaka and Katsumata do not exemplify a perpendicular magnetic recording system satisfying the following equation:

$T_{bl} < (B_{sl} \times T_m \times T_{ww}) / 2(B_{s2} \times (T_m + T_{ww}))$,

where T_{bl} is the thickness of said soft magnetic underlayer in said perpendicular magnetic recording medium, B_{s2} is the saturation flux density of the same, T_m is the thickness of said main pole along a track direction in the vicinity of its floating surface, T_{ww} is the track width of the same, and B_{sl} is the saturation flux density of the same. However, Tanaka discloses the following values: $B_{sl} = 1.52$ T (col. 7, line 20); $T_m = 5$ μm; and $T_{ww} = 1$ μm (col. 9, lines 1-3).

Yet, Nakamigawa discloses a perpendicular magnetic recording medium with the following values: $T_{bl} = 0.5$ μm (Nakamigawa English translation, section 0044) and $B_{s2} = 0.50$ T (5,000 G) (Nakamigawa English translation, section 0012).

Substituting the specified values into the above equation results a $T_{bl\,calculated} = 1.27$ μm, which is greater than 0.5 μm. Therefore, the equation is satisfied, i.e., 1.27 μm > 0.5 μm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the perpendicular magnetic recording system of Tanaka and Katsumata with the perpendicular magnetic recording medium as taught by Nakamigawa .

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the perpendicular magnetic recording system of Tanaka and Katsumata with the perpendicular magnetic recording medium as taught by Nakamigawa in order to increase the recording density of the perpendicular magnetic recording medium and to show the relationship of the saturation flux density to the thickness of the soft magnetic underlayer.

- Regarding claim 4, Tanaka discloses a track width, $T_{ww,}$ less than 0.5 μm (col. 9, lines 60-63).

- Regarding claim 5, Tanaka or Katsumata do not set forth the dimensions in these claims. However, Katsumata teaches that G_{L1} in Figure 3, is the distance between the main pole 4 and the upper shield 2 (i.e., auxiliary pole 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the perpendicular magnetic recording head of Tanaka and Katsumata with a distance between the main pole and auxiliary pole being greater or equal to 5 μm.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the perpendicular magnetic recording head of Tanaka and Katsumata with a distance between the main pole and auxiliary pole being greater or equal to 5 μm in order to maintain high reproduction resolution (*Katsumata*; col. 8, lines 22-34)

- Regarding claim 6, Nakamigawa discloses the thickness, T_{bl}, of the soft magnetic underlayer in the perpendicular magnetic recording medium is smaller than or equal to 0.2 μm (Nakamigawa English translation, section 0044).

Response to Arguments

2. Applicant's arguments filed 4/1/2005 have been fully considered but they are not persuasive.

First, the Applicant asserts on page 2:

> *"The Examiner states that Nakamigawa discloses a perpendicular magnetic recording medium that has the following values: T_{bl}=0.5 μm (page 2, section 0007), B_{s2}=0.5T (5000G) (page 3. section 0012). However, the description '0.5 μm or less' in section 0007 refers to the film thickness of a magnetic layer as a recording magnetic film, and it does not mean the film thickness of the soft magnetic underlayer. Thus, saying T_{bl}=0.5 μm is an incorrect statement due to this misinterpretation."*

The Examiner contends that Nakamigawa discloses a perpendicular magnetic recording medium with the following values: T_{bl} = 0.5 μm (Nakamigawa English translation, section 0044) and B_{s2} = 0.50 T (5,000 G) (Nakamigawa English translation, section 0012).

Last, the Applicant further states on page 2:

> *"It is meaningless to combine Tanaka with Nakamigawa, since Tanaka does not disclose the thickness of the underlayer and Nakamigawa does not disclose the head structure. It is also meaningless in view of the fact that the two are directed utterly different structures, namely hard disk drives and floppy disks, which operate differently. As a result the teaching of the two patents related to basically different objects. Therefore, it is naturally meaningless to further combine these two references with Katsumata."*

In response to applicant's argument that Tanaka and Nakamigawa are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Tanaka shows a perpendicular magnetic recording system (see Figure 5) comprising a perpendicular magnetic recording medium having a soft magnetic layer and a magnetic recording head for performing magnetic recording on said perpendicular magnetic recording medium, said magnetic recording head having a main pole for finally recording a magnetization reversal on said perpendicular magnetic recording medium. Nakagimawa discloses a perpendicular magnetic recording medium. Tanaka and Nakagimawa are related in that they all disclose perpendicular magnetic recording techniques. Hence, both prior art references are within the field of the inventor's endeavor.

Therefore, the rejection of claims 1-6 is upheld.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (571) 272-7592. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher R. Magee
Patent Examiner
Art Unit 2653

June 13, 2005

WILLIAM KORZUCH
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